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COUNTRY : USSR

SUBJECT : ARTILLERY COLLECTION: "The Maneuver of Missile Units in an Offensive Operation"

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The Maneuver of Missile Units in an Offensive Operation

In conditions of employment of atomic weapons and the increased capabilities of combined-arms large units, armed combat acquires a character of high maneuverability and will develop in wide areas. For this reason, in modern operations there is a particular increase in the importance of maneuver of forces and weapons and especially of fire (manevr ognem) on the battlefield in order to strike crushing blows against the enemy. The leading role in routing the opposing enemy grouping is played primarily by atomic weapons.

By using mass atomic strikes in the main direction and against the basic enemy grouping it is possible to inflict decisive destruction on the enemy and ensure a swift offensive by tanks and infantry, without having to concentrate (uplotnyat) their battle formations. Moreover, the massing of atomic strikes for resolving the main missions in an offensive operation is not possible without a wide-spread maneuver of missile and rocket units.

The maneuver of these units on wide areas along the front and in depth in order to mass fire against enemy objectives is one of the most important conditions for the attainment of success in combat and in an operation. Therefore, the art of employing missile units in a modern operation, depends on the ability to maneuver them.

A skilfully prepared and timely executed maneuver of fire creates favorable conditions for troop operations in wide zones, and allows them to carry out their missions with considerably smaller forces and in greater depth. Conversely, fire passivity, the untimely maneuver of units, procrastination in preparing and carrying out powerful fire strikes during the operation, can lead to heavy losses from enemy fire, can put the troops into an unfavorable position, and thus lessen the effect of the initial strike and slow down the tempo of the offensive.

Atomic strikes are the basis of mass fire of missile units. Their tremendous firepower, their high destructive action, and long range of fire expand to a great extent

the capabilities, and heighten the significance, of the maneuver of fire. A timely executed maneuver of fire by missile units with the use of atomic ammunition may eliminate the necessity for maneuver and employment of large masses of tanks and infantry and also conventional artillery using conventional ammunition, or considerably reduce the scales on which they are used.

In view of its depth and the importance of the missions to be solved, the maneuver of missile units acquires not only a tactical but also an operational significance. Therefore, the organization of the maneuver of these units and of their fire must be the main concern of the commanders of artillery of a front and an army and their staffs during the course of an offensive operation.

The main role in maneuvering missile units must be played by the maneuver of fire, because by this means a quicker solution of the missions and surprise of fire are achieved to a greater degree.

Fire and maneuver are interrelated factors. Mass fire in a number of cases is impossible without the maneuver of missile and rocket units.

One should not make contrasts and draw a definite line between the maneuvers of fire and the maneuvers of missile units. Any maneuver of missile units has as its final aim the provision of the capability to inflict fire strikes against the enemy, i.e., in the interests of delivery of fire.

The capabilities of maneuver of fire, apart from other conditions, are also determined by the relationship of the grouping and of the disposition of combat formations of missile units to a specific situation. It follows that in the course of an operation, in order to create conditions for a wide maneuver of fire, it will also be necessary to resort to a maneuver of units.

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When firing atomic ammunition it is sometimes necessary to resort to maneuvering (changing the location of) launchers in order to create the best conditions for carrying out the fire missions because the effectiveness

of firing atomic ammunition of given or available yield also depends on the conditions of fire (primarily on the range of fire).

When organizing the maneuver of units (subunits), one should strive to restrict them to essential limits through the fullest utilization of the ranges of fire and fire maneuver capabilities. Moreover, one should take into account the effectiveness of fire (dispersion of rounds) and the possibility of the certain destruction of the targets by available ammunition, including atomic ammunition.

The concept of maneuvering missile units should not be limited to the maneuver of fire and of subunits (units). For these units a wide maneuver with atomic ammunition and the accompanying technical equipment will also be characteristic, inasmuch as they carry out their main missions in the operation with atomic ammunition.

Maneuver with conventional ammunition was also carried out in the past. However, for obtaining decisive results one had to move to a great quantity of ammunition, which required a great deal of transport, effort, and time.

In modern operations it is enough to move a comparatively small amount of atomic ammunition to the required direction in order to ensure in a short time the capability of destroying the main enemy grouping or the most important enemy objectives and creating favorable conditions for the operations of friendly troops.

Maneuver with ammunition of missile units will consist of redistribution and timely dispatch of ammunition and special fuel to subunits and units which are capable of getting ready to strike against the enemy in the shortest possible time.

The need for maneuver with atomic ammunition may arise fairly often, because their quantity among the troops will be restricted, and for this reason it will not be possible to have it always available in reserve in sufficient quantity in all directions.

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Maneuver with atomic ammunition also takes place

when the necessity arises of supplying charges of the required yield for the solution of specific fire missions, when due to conditions of the situation the fire mission cannot be performed with the ammunition available.

To ensure maneuver with atomic ammunition, it is essential to have reliable means of transport, for instance, helicopters specially equipped for these purposes and special vehicles which are capable of delivering the ammunition quickly and reliably to the place required.

Maneuver with missile units and their fire will depend on the character of the missions being carried out by the troops, on the availability of these units and their capabilities, and also on the availability of atomic ammunition and the order of its use.

During the course of an offensive operation, the need for maneuver of missile units will arise mainly for the solution of such important missions as combating enemy weapons of atomic attack and reserves, repulsing his counterattacks and counterstrikes, securing the entry into the battle of second echelons and reserves, supporting troops when crossing water obstacles in force from the march, and also when surrounding and destroying large enemy groupings and when transferring the efforts of the troops from one direction to another.

One of the most important missions of missile units is the destruction of enemy weapons of atomic attack. When resolving this mission, one must take into account that the enemy has powerful means of atomic attack and in fairly large quantity.

It suffices to say that a USA army corps of modern organization at medium strength can have up to 80-85 various guns and rocket launchers capable of using atomic ammunition, a field army can have up to 250-270, and an army group something like 500.

The overwhelming majority of them (up to 90-95 percent) will be located within the limits of the first zone of defense, the remainder (5-10 percent) - at a distance of 30 to 100 kms and further.

The distribution of the means of atomic attack along the front will allow the enemy to launch strikes against our troops from varying directions.

It is obvious that if these weapons are not destroyed in time, or at least their striking power is not weakened, one cannot expect the operation to be successful.

It should be stressed that this mission will be resolved by the combined efforts of missile units, conventional artillery, and aviation.

The missile units will be called upon for combat with enemy means of atomic attack located in depth. For the destruction of enemy weapons of atomic attack located at an inconsiderable distance, conventional artillery should also be used and, in the first place long-range guns, because one must not count on a missile with an atomic warhead being used on every enemy installation.

It is perfectly clear that the mission of combating the weapons of atomic attack cannot be carried out successfully without a wide and rapid maneuver of fire of missile units.

The maneuver of these units with the aim of combating enemy means of atomic attack will have to be carried out not only during the course of the operation, but also during preparations for the operation, especially for the purpose of supporting the forward movement and deployment of friendly troops for the offensive.

The success of combating enemy means of atomic attack will depend to a great extent on the timely state of readiness of missile units to carry out destruction of the enemy's weapons immediately after detection. Therefore, during preparations, as well as during the course of the operation, a certain quantity of launchers and atomic ammunition must be in constant readiness to inflict strikes.

Prior to the beginning of an operation, several firing positions should be prepared in different directions and at varying distances from the enemy, as well as access roads

to them and cover for the units carrying out the maneuver to these positions.

The maneuver of fire and of subunits (launchers) in these conditions must be executed with precision and speed, because otherwise the enemy will have an opportunity to strike first.

At the same time the mission of destroying enemy atomic weapons must be resolved by the subunit which can be prepared to deliver the strike in the shortest time, irrespective of whether these weapons are located in the zone of this or that large unit or formation.

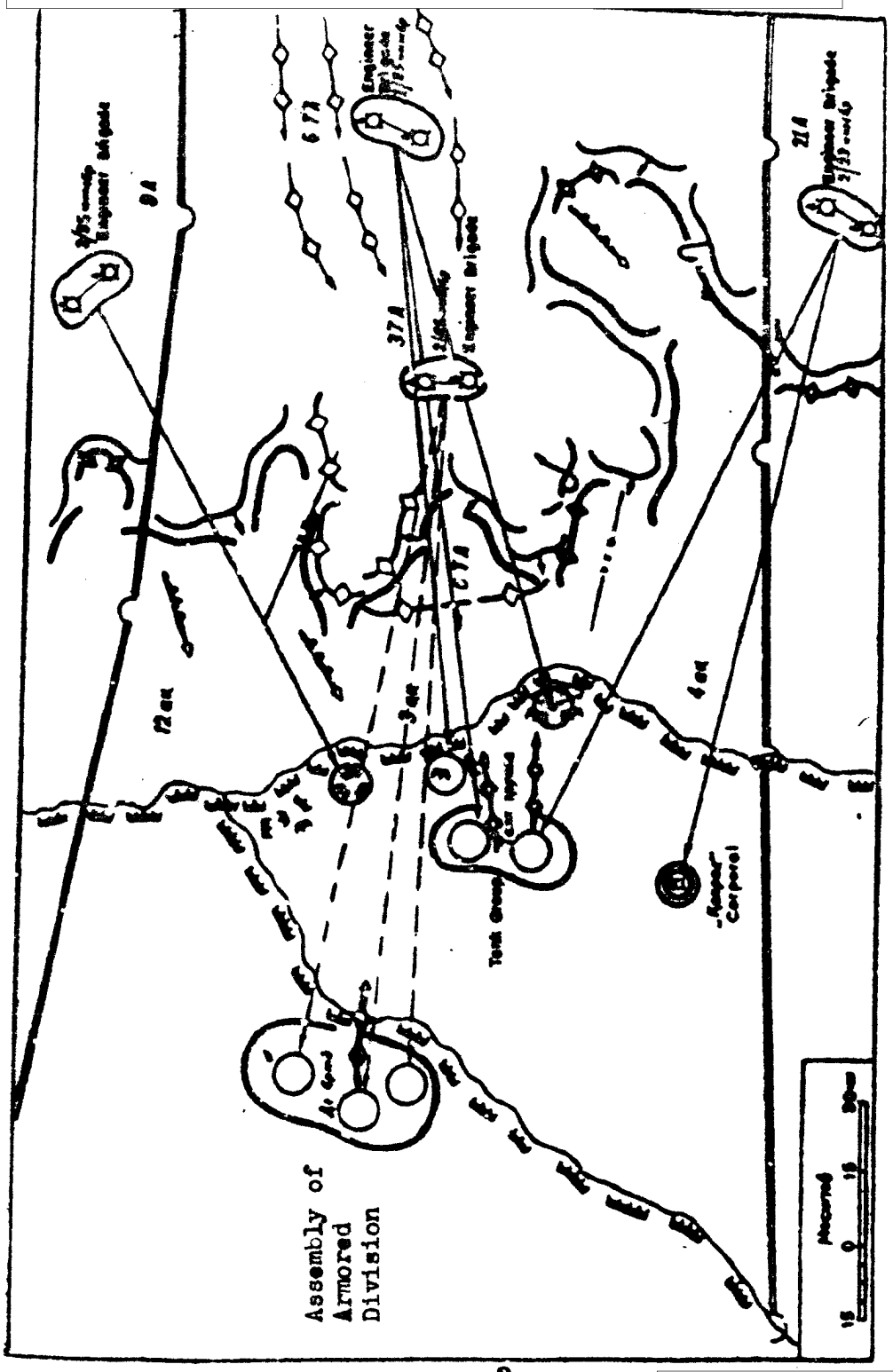
Sketch 1 shows an example when, in the zone of advance of an army, a "Corporal" guided missile (URS) battery is spotted on its left flank moving to a launching site. Moreover, the battalion of the engineer brigade is unable to hit this target from the firing positions it occupies because it is out of range, while the second battalion is in the process of occupying its firing positions.

It is obvious that in this case, for the destruction of the enemy "Corporal" battery, it is essential to call upon a battalion of the neighboring 21st Army zone.

When resolving the destruction of the means of atomic attack, an important role is played by the time necessary to carry out the strike, because this is connected with the duration of stay of enemy atomic weapons in their positions and the tactical-technical characteristics of the weapons and used for their destruction.

For instance, to deliver the assembled "Corporal" guided missile from the technical site to the launching site, including setting it up, arming it, and the launching process, would take the enemy about two hours. It follows that from the moment of spotting the forward move of the enemy battery to the launch position until the strike is delivered, not more than one to one and a half hours should elapse.

When organizing the destruction of enemy means of atomic attack, it is essential to consider the time of possible



Sketch 1. Maneuver of Fire of Missile Units to Destroy Enemy Means of Atomic Attack and Reserves

readiness of this or that subunit for the delivery of a strike, and to use in the first place such means as will ensure the fulfillment of the mission in the shortest possible time.

This can be done only by the widest maneuver of fire of missile units of tactical designation in the entire zone of the army and neighboring zones, and the missile units of operational-tactical designation in the zone of the entire front and even in a sector of the neighboring front.

The maneuver of missile units and large units and of their fire becomes most important when the second echelon of a front (army) is committed to battle.

As a rule, the second echelon of a front is committed to battle from the march.

In these circumstances, in cooperation with aviation, by a mass atomic strike, before the second echelon is committed, decisive destruction must be inflicted on the enemy, his main grouping should be weakened to the maximum degree, his identified means of atomic attack should be destroyed, and thus create favorable conditions for the deployment and commitment to battle of the second echelon, as well as for a swift development of the offensive.

This can be achieved by a mass atomic strike using the major part of the missile units of the front.

It was sometimes noticed during a number of exercises that for solving this problem the atomic strikes were planned, in the main, immediately in front of the designated line of commitment of the second echelon, to a short depth, and were timed for the actual moment of departure of the second for the previously designated line. Such delivery of atomic strikes did not have the desired effect.

Supporting the commitment of the second echelon of a front in modern conditions consists in the first place of preventing the enemy from carrying out a mass atomic strike during the period of forward movement and deployment of the army for commitment and also to prohibit a counterstrike and counterattacks by the enemy reserves.

Indecision and procrastination in destroying enemy

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means of atomic attack when the second echelon is being brought forward for commitment to battle may result in the second echelon suffering heavy losses from a mass enemy atomic strike and being obliged to engage in lengthy and exhausting fighting.

Therefore, the most important mission when the second echelon of a front is being committed to action is the destruction of the enemy means of atomic attack and his reserves which are moving up, especially armored. (See Sketch 1).

Artillery, by its fire, must also support swift development of the offensive into the depth of the enemy defense. In these conditions the missions of missile units of operational-tactical designation must be in the main those of long-range fire support, in order to destroy the most important deep-lying enemy objectives (means of atomic attack, troop concentrations, reserves moving up, etc.)

For the solution of missions in backing up the commitment of the second echelon and the support of its operations in the depth of the enemy defense, an appropriate grouping of artillery must be created beforehand, and its combat formations chosen with the aim of fulfilling its assigned fire missions both during the commitment and in support of the further operations of the second echelon.

This will entail a partial regrouping and also the maneuver of independent missile units.

Partial regrouping of missile units will also be required when it is necessary to strengthen the second echelon of the front, by resubordinating them from the command either of the first echelon itself or from units under direct command of the front.

Maneuver by missile units must be completed in such a way as to ensure their readiness to open fire at the start of the forward movement of the second echelon of the front toward the line of commitment.

Experience in exercises shows that it is expedient

to change the subordination of missile units of tactical designation to the formation (obyedineniye) of the second echelon of the front in the area of concentration, located some 40 to 50 kms from the line of commitment, or directly in combat formations. As a rule it is expedient to resubordinate missile units of operational-tactical designation to combat formations already formed at prepared siting areas. This will ensure the timely readiness of missile units and large units to open fire.

On bringing the second echelon of the front into battle, when the time factor is vital, it will be more usual to resort to fire maneuver of missile units (including switching from one army zone to another), rather than to regroup them. For tactical missile units it will be more normal to carry out a broad maneuver by subunits, in order to concentrate their efforts on the more important axes, since this is dependent on the operations of troops in wide zones, in separate directions, and with wide gaps between the units and large units, which will certainly restrict the possibilities of fire maneuver.

The threat of being subjected to counterattacks and counterstrikes by highly mobile enemy reserves will arise in modern operations much more frequently than in the past.

The capabilities of missile units will allow the offensive side to disrupt the counterstrike of enemy reserves at its very inception by the destruction of the reserves in the areas of concentration (unloading areas) or at the beginning of their forward movement for a counterstrike.

For the execution of this mission it may be necessary to carry out a maneuver by these units.

During the course of an operation a situation may arise when the troops of a front may go over to the defensive with part of their forces in order to repulse the counterstrike of a powerful enemy grouping, while the main forces continue the offensive.

In this case the necessity arises of resolving two missions at the same time: to support the offensive of the main grouping of the front and ensure the repulsing

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of the enemy counterstrike.

It is quite understandable that the solution of these missions will be carried out in the first place by maneuvers of the fire of missile units from one direction to another, but the necessity of regrouping individual subunits of these units should not be excluded.

The change of location of missile subunits during the course of an operation is one of the elements of the general complex of measures connected with the maneuver of artillery.

It has to be organized and carried out in such a way as to ensure the constant readiness of the necessary number of subunits and units for the delivery of atomic strikes, first of all against the enemy means of atomic attack. Proceeding from these requirements, it is advisable as a rule to move battalions of missile units of tactical designation battery by battery, and at the same time their first move should start with the capture by friendly troops of the enemy combat position, and with the occupation of the siting area within the limits of the combat position or behind it. The state of readiness of the battery in the new siting area determines the movement of the remainder of the battalion to the next siting area.

The length of the bound will depend on the range of fire, the speed of the troop offensive, the speed of movement, and the time required for the deployment and preparations for firing in the new area.

The longer the range of fire of the system, the longer may be the bound during the movement. Nevertheless, the main determining conditions when solving the problem of the sequence of movement should first of all be the ensuring of constant readiness to strike the enemy to a maximum depth, and the uninterrupted fire support of troops by atomic strikes.

During the course of an operation, subunits of missile units must be in constant readiness to destroy enemy means of atomic attack and other important objectives in the depth of the enemy defenses (infantry and tank concentrations, reserves moving up, etc). The greater part of the enemy

means of atomic attack will be located within the defenses, as a rule at a distance of 8 to 12 kms from the line of forward enemy subunits. For this reason the possibility should be envisaged of conducting the fire of missile units of tactical designation to that depth at any given moment of the operation.

Below is given an example of one of the variants of calculation showing how the depth of fire effect on the enemy will be changing from the beginning to the end of the move of part of a battalion to a new siting area.

Let us presume that the system has a range of fire of some 30 kms. Let us take the possible length of the bound to be 1/3, 1/2, and 2/3 of the range of fire. The battalion's departure position is 8 kms from the main line of resistance. The speed of advance of the troops is 3 to 4 kms per hour. On an average two hours will be required for the movement, deployment, and preparations for opening fire from the new siting area. During that time the advancing troops will move forward a distance of old firing positions will be correspondingly lessened.

For instance, in one case, when the length of the bound is equal to 1/3 of the range of fire, that is, 10 kms, at the start of the move with the occupation of the combat position by the infantry (we shall take its depth as being equal to 5 kms), the depth of strike at the enemy from the old firing positions will be in the region of 17 kms at the beginning of the move.

When the part of the battalion that has been moved is ready for firing from the new firing positions (in about 2 hours), the depth of strike from the old firing positions will be reduced by 6 to 8 kms and will be about 9 to 11 kms.

In another case, when the length of the bound is equal to 1/2 of the range of fire, or 15 kms, at the beginning of the move with the moving up of the infantry into the new siting area, the depth of strike at the enemy from the old firing positions, which at the beginning of the movement was 15 kms, will be reduced to 6 to 8 kms by the end of the move, and finally, if the length of the bound equals 2/3 of the range of fire (20kms), the depth of strike will be 10 kms at the beginning of the movement but will be reduced to 1 to 3 kms by the time it is completed.

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By making similar calculations for systems with various possible ranges of fire, it is possible to draw up a table of the possible depths of strike at the enemy at the beginning and at the end of a move, depending on the size of bound of the move.

Range of fire of the system / Length of bound movement	20 kms		30 kms		50 kms	
	Depth of strike at the enemy					
	at beginning	at end	at beginning	at end	at beginning	at end
1/3 Range of fire	10	6	17	10	32	25
1/2 Range of fire	9	3	15	7	24	14
2/3 Range of fire	5	0	10	3	16	6

It is apparent from the table that in the case of systems with a range of fire of about 20 to 30 kms, it is most advisable to carry out the move battery by battery, fixing the length of the bound within the limits of 1/3 of the range of fire.

For systems with a range of fire of 40 to 50 kms, the move is advantageously carried out when the bound is fixed to within 1/3 to 1/2 of the range of fire.

The move with a length of bound of 2/3 of the range of fire is not advantageous, as is clearly shown in the table and the examples cited. Nevertheless, such conditions as, for example, the setup of the enemy defense, the nature of the disposition of possible objectives for destruction, the reciprocal distance of the zones and lines of defense, conditions of the terrain and the condition of the road network, may greatly influence the practical solution of

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problems of movement and distribution in possible siting areas.

The examples cited of the sequence of moves are examined in general lines and are based on calculations, and they may not always in the proper degree answer the specific conditions of the conduct of a battle and an operation. For this reason, when organizing a move the specific tasks and operational conditions should be taken into account. For instance, if the enemy has been reliably neutralized in the first zone of defense, when the move is carried out in the interests of an atomic strike on the second zone of defense, the main part of the missile units and subunits of tactical designation can be moved battalion by battalion directly into the area of the firing positions from which this mission can be carried out. Those units and subunits whose range of fire ensures the destruction of enemy objectives in the second zone from the firing positions they occupy will start the move after it has been occupied by our troops.

In all cases of organizing a move, part of the subunits of missile units of tactical designation must be kept in readiness to destroy newly identified enemy means of atomic attack.

In the course of the development of an operation in the operational depth, the tempo of the offensive may be fairly high, and for this reason it will be difficult to carry out a consecutive move battery by battery. In such cases it is advisable to move separate batteries with prepared atomic ammunition behind the infantry and tank combat formations at a distance of 5 to 7 kms. Such batteries will be able to occupy a position swiftly in case of necessity and get ready to open fire. The remainder of the battalion will be able to move consecutively from cover to cover.

The move of subunits of missile units of operational-tactical designation has a number of peculiarities compared with the movement of missile units of tactical designation.

These peculiarities are related first of all to the very long bounds of movement and with the lengthy period required for deployment and preparation for firing by the

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missile units from new siting areas.

The nature of the terrain and the condition of the movement routes have a great influence on the time of the move.

The condition of roads (the width of the roadbed, the steepness of ascents and descents, and the radius of turns) and bridges must answer the appropriate requirements permitting the carrying out of the move of missile units and the bringing up of missiles and special fuel.

The siting areas for missile units should be chosen with fairly capacious dimensions. They must ensure dispersed disposition along the front and in depth and the camouflaging of all subunits, the capability of preparing several firing positions for each launching assembly, and the carrying out of a wide maneuver of fire, and must have convenient access roads.

This gives rise to certain difficulties in choosing siting areas and in preparing routes.

The considerable distance of the combat formations of missile units from the forward subunits of friendly troops (up to 30 to 50 kms) and the clearing of routes for their move, entail the taking of appropriate steps for the guarding and defense of these units both in their positions and on the march.

With the existing organization it is necessary to carry out the movement of missile units battalion by battalion, and when there are several brigades, brigage by brigade, because this is the best way to achieve topographic-geodetic, meteorological, and material-technical support, the preparation of initial data, and the technical preparation of missiles for firing.

In individual cases battery by battery movement may also be carried out. For instance, this may happen when only one battalion is operation in an army zone and it is necessary to ensure constant missile unit fire support.

Taking into consideration the difficulties connected with a move and with the deployment and preparation of

missile units for firing from new siting areas, it is necessary to avoid frequent moves of these units, but to use to the maximum their long range and wide maneuver of fire. However, a situation should not be allowed to develop in which at given moments some missile units are moving and the others are not able during this time to strike at objectives in the depth of the enemy's dispositions from the old firing positions.

The most favorable occasion for the organization of a move would be when an army has subordinate to it not less than two battalions, or one battalion, but with missile units subordinate to the front operating in its zone.

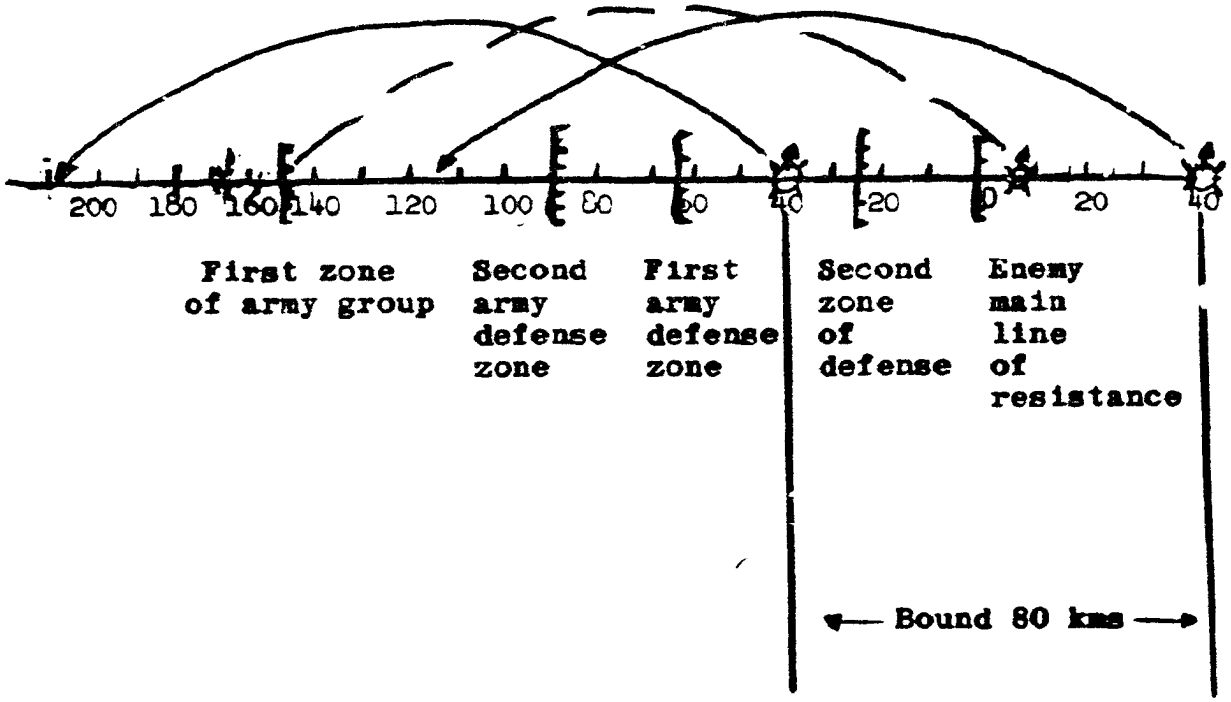
The length of the bound during the move may vary. But one should take into consideration that the margin of the range of fire of the remaining unit (subunit) should permit the destruction of enemy objectives until the missile unit (subunit) that has been moved is ready to open fire from the new area.

Let us see how the length of the bound will depend on the location of the zones and lines of defense of the enemy.

We shall take the distances of zones and lines of defense as follows: the second zone of defense is 25 kms; the first army defense zone is 60 kms; the second army defense zone is 90 kms; the first defense zone of the army group is 150 kms (Sketch 2).

The rate of advance of the troops is 30 kms in 24 hours. The range of fire of missiles with atomic warheads available in the battalion is up to 150 kms.

In this case the new siting area should be behind the second defense zone. The length of the bound may be in the region of 70 to 80 kms. The troops will move to the new siting area by the morning of the second day of the operation. The first echelon troops must be followed by the reconnaissance group of an engineer battalion, which carries out the selection and the topographic-geodetic preparation of the new siting area.



Sketch 2. A variant of movement of missile units during the course of an operation, taking into account the layout of the enemy defense.

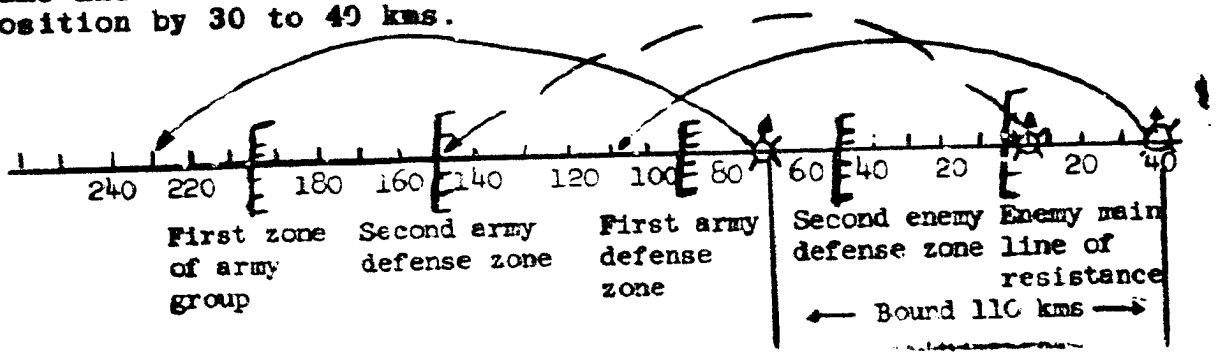
By the morning of the third day of the operation the firing positions will have been surveyed. The move of the battalion to the new siting area (the length of the route about 100 kms) will require about 7 hours, the dismantling (svertyvaniye) will require about 1 hour, and setting up (razvertyvaniye) in the new area will require up to 4 hours. Thus, up to 12 hours will be required in all. It follows, that the move can be started at the end of the second day of the operation.

The move of the remaining missile unit (subunit) should be started when the unit (subunit) previously moved is ready to open fire.

When the distance of the second zone of defense is 50 kms, the first zone of defense of an army is 90 kms, the second zone of defense of an army is 150 kms, the first zone of an army group is 200 kms (Sketch 3), and the rate of advance is 40 kms in 24 hours, then the new siting area will also be behind the second zone of defense. It could even be fixed nearer to the first army defense zone. The length of the bound of a move in this case will be slightly greater, i.e., in the region of 100 to 110 kms. It should be possible in this case to have the battalion ready for firing from the new siting area by the end of the third day of the operation.

Subsequent moves should be envisaged, depending on the missions which will have to be carried out by the missile units.

Let us examine the sequence of moves of missile units when an army has one engineer battalion. In order to ensure the greatest use of the range of fire from the areas in the initial position, it is advisable to move one launch battery at the start of the offensive to a siting area located in the vicinity of the friendly main line of resistance and previously prepared as regards topographic-geodetic and engineering work. Such a move allows the battery to get ready for firing in a short time and to increase the range of fire from the initial position by 30 to 40 kms.



Sketch 3. A variant of movement of missile units during the course of an operation, taking into account the layout of the enemy defense.

Thereupon, the remaining part of the battalion is moved forward to a new siting area. When the batteries are ready to open fire from the new siting area, the above-mentioned battery is moved there too. Subsequent moves are carried out by the entire battalion.

The moving of missile units in a front should be calculated so that the necessary number of them are ready to fire at any given moment of the operation. It is especially important to ensure the timely readiness of missile units to carry out their missions during the most crucial phases of the operation the commitment to battle of the second echelon of a front, the repulse of an enemy counterstrike, etc.

In order to ensure the timely readiness of missile units it is essential to plan with care the work of the topographic-geodetic subunits in preparing the deployment areas from the topographic-geodetic point of view.

The moves of missile units are planned by the artillery headquarters of a front for missile units subordinate to a front, and in an army by the artillery headquarters of the army. At the same time, the artillery headquarters of a front must coordinate the dispersal and movement of all missile units, whatever their subordination.

If this is not done it may happen that several battalions will turn up in the same area at the same time, part of which are under army subordination and the other part under front subordination.

Besides this, the artillery headquarters of a front must issue instructions on the sequence of movement of missile units in the interests of the preparation of mass atomic strikes which the front is planning to carry out during the course of the operation (for instance, before committing the second echelon of a front to battle).

There is no need to form a special plan of movement. It should be worked out on the fire-control map.

When planning a maneuver of atomic ammunition assembly units (chast sborki atomnykh boyepripasov), it is essential first of all to proceed from the decision taken regarding the employment of atomic ammunition in the operation, the timing of infliction of atomic strikes by missile units, the availability, receipt, and degree of readiness of atomic ammunition

on hand, and their assembly capabilities. Depending on these conditions, the atomic ammunition assembly units may carry out the maneuver either at the same time as the missile units or slightly ahead of them in order to ensure the timely preparation of atomic ammunition. This is not to exclude the case when the assembly units may be left in the area occupied, since assembled atomic ammunition can be transported considerable distances (up to 200 kms and sometimes even more).

During the course of combat operations, the necessity may very often arise for an unplanned maneuver of missile units and of their fire. The carrying out of such a maneuver calls for high operational efficiency in the work of the commanders of artillery and their staffs. They should always know the decisions taken by the commander of a front (army), the location of missile units and the missions which they are resolving, the degree of readiness of atomic ammunition and special charges, the location and capabilities of atomic ammunition assembly units, and also the disposition of friendly troops and the troops of the enemy.

The commander of artillery should always be ready to report to the commander of the front (army) which units are in a position to carry out the maneuver, how long a time this will require, and what steps are deemed advisable to ensure the speed of the maneuver.

After the commander of the front (army) has approved the plan for maneuver of missile units and large units, or the decision to carry out an unplanned maneuver, the commander of artillery and his staff must coordinate with the headquarters of the front (army) the movement routes, the new siting areas, and the timing of the maneuver, so that the selected areas are not occupied by other troops and the routes are clear.

The question of the steps to be taken for counteracting enemy reconnaissance, primarily aerial and radiotechnical, which could detect the maneuver of missile units and large units, should be decided by the chief of staff of a front (army).

The procedure for conducting radiation and chemical reconnaissance on the routes and in the new siting areas is specified by the chief of chemical troops.

The questions of preparing the movement routes and the possibilities of reinforcing the missile units carrying out the maneuver with units (subunits) of engineer troops in order to ensure a rapid maneuver and to carry out the engineering work connected with equipping of combat formation elements in the new siting areas are coordinated with the chief of engineer troops of a front (army). Special attention during this should be paid to the restoration and, when necessary, the construction of new bridges and crossings across water obstacles and the repair of roadbeds.

Questions of the topographic-geodetic preparation of new siting areas of missile units, as well as the possibility of reinforcing them with subunits of the military-topographic service are coordinated with the chief of the military-topographic service of a front (army).

It is essential that questions of cover from enemy air strikes for missile units along the routes and in the new siting areas are coordinated with the chief of antiaircraft defense troops of a front (army).

As is apparent, the volume of work of the commander of artillery of a front (army) and his staff in organizing the maneuver of missile units is considerable. For this reason, it is always necessary to try to complete at least part of the above-mentioned measures during the planning stage, before the maneuver is carried out.

It is evident that reconnaissance groups, having in their composition topographical subunits and dosimeter operations for reconnoitering the radiation situation, should be moved forward in good time, before moving the missile units to the selected areas. One of the priority missions of these groups is reconnaissance of the routes and selection of firing positions, the siting (opredeleniye) of the elements of combat formations, and their topographic-geodetic tying in (privyazka), which also includes orientation (orientirovka). Such groups should be headed by officers capable of taking the appropriate decisions independently.

When it is necessary to carry out engineering work both on the routes and at the firing position areas of the missile launchers, it is advisable, in coordination

with the headquarters of a front (army), to send out engineer subunits.

Modern conditions of conducting operations oblige the commander of artillery and his staff to exercise direct control of the maneuver of missile units, and not limit themselves just to its supervision. In modern operations, during the course of a maneuver, various difficulties and obstacles will be encountered.

The enemy, by using atomic and chemical weapons, as well as engineer means, will try to frustrate the maneuver of our troops by the delivery of atomic strikes during the march and during the deployment of troops, and also by destroying and contaminating the routes and crossings, resorting to the creation of zones of radioactive contamination in large areas of terrain.

The commander of artillery and his staff must constantly follow the radiation situation and, in case of need, make timely changes in the movement routes of missile units and subunits. Large units and units, when radioactive contamination is discovered in wide sectors of the terrain should not change routes on their own initiative, except in certain cases, because not knowing the overall radiation situation, and arriving at conclusions about it based solely on the results of their own reconnaissance, they may find themselves in a most difficult situation.

The change of routes should usually be indicated by the artillery headquarters of a front (army) for the additional reason that the large units and units, themselves may choose routes occupied by other troops, which also could result in the frustration of a maneuver.

During the course of a maneuver, the situation may call for a change not only of routes but also of the firing position areas (waiting areas). For this reason, the commander of artillery, following the situation constantly, must in good time add the necessary further details to the orders previously issued. Changes in a maneuver must be communicated to the commanding officers of missile large units (units) and commanders of artillery of the large unit directly during the march. This calls

for constant liaison with the missile units engaged in the maneuver. At the same time, the commanding officers of missile large units (units) should show maximum initiative during the maneuver in order to complete the assigned mission within the time limits.

The nature of a modern battle or operation calls for the most decisive maneuver of missile units, and especially of their fire. For this reason, the maneuver of these units is one of the most important bases of their combat use in a modern offensive operation.

In this article, only some questions relative to the maneuver of missile units have been examined.

The maneuver of missile units will play a no-less-important part in the carrying out of other missions (the forcing of water obstacles from the march, the encirclement and destruction of surrounded enemy groupings, pursuit, airborne landings. etc).

The importance of such a maneuver is especially great during operations in the initial period of a war, when the insufficient quantity of means of reinforcement must be compensated for first of all by a rapid shift of effort from one direction to another, i.e., by the maneuver of units, and especially of their fire.

In conclusion it is essential to point out that the organization of the maneuver of missile units and of their fire is one of the basic problems of their control.

The success of the maneuver of missile units depends on many factors, including the timely receipt of intelligence, speed in making a decision, and in passing the missions to those carrying them out, as well as on the tactical-technical characteristics of missile launchers, (the time required for dismantling and setting up, preparation for the first launching, time required for reorientation to a new target, etc.) For this reason the improvement of existing methods, the search for new forms of controlling missile units, and the improvement of the tactical-technical characteristics of missile launchers will have a direct bearing on their maneuver.